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Jacob et al.

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(54) **MOLDED MASCARA BRUSH HEAD WITH RAKE-LIKE TEETH**

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(51) **Int. Cl.**

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A45D 40/26	(2006.01)
A46B 9/02	(2006.01)

(52) **U.S. Cl.**
CPC ***A45D 40/267*** (2013.01); ***A46B 9/021*** (2013.01); *A46B 9/028* (2013.01)

(58) **Field of Classification Search**
CPC A46B 9/00; A46B 9/028
USPC 401/121–127, 129; 132/212, 216, 218
See application file for complete search history.

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(57) **ABSTRACT**

A cosmetic package is provided with an applicator brush head that has rake-like teeth extending from the core of the brush head. Each tooth has a flexible vertical post extending from the brush core to a horizontal beam. Several tines extend vertically from the beam to free ends. When the brush is drawn through a wiper in the product vial, the flexible vertical post allows the rake teeth to bend such that the tines pick up cosmetic product deposited at or near the core of the brush. As the brush head leaves the wiper, the rake-like teeth return to an upright position carrying the cosmetic product at or near the free ends of the tines.

17 Claims, 8 Drawing Sheets

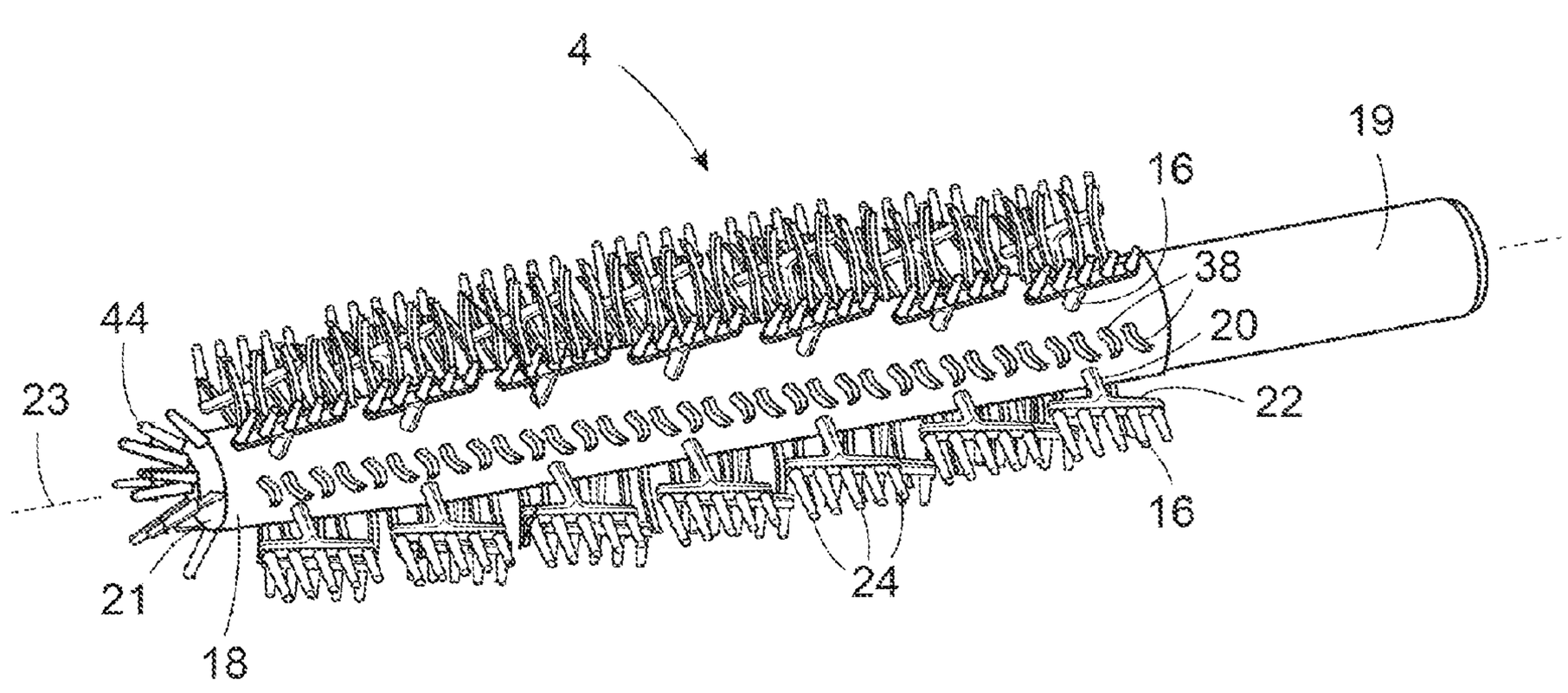

FIG. 1

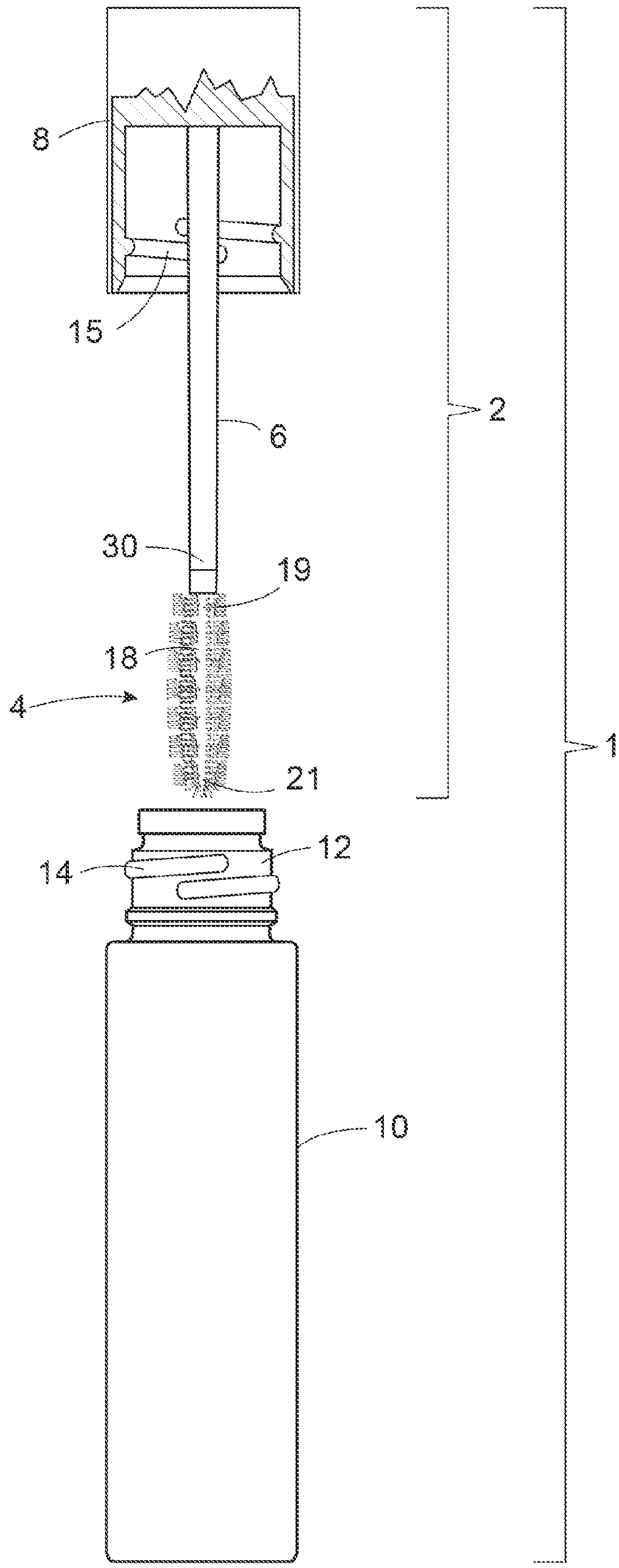

FIG. 2

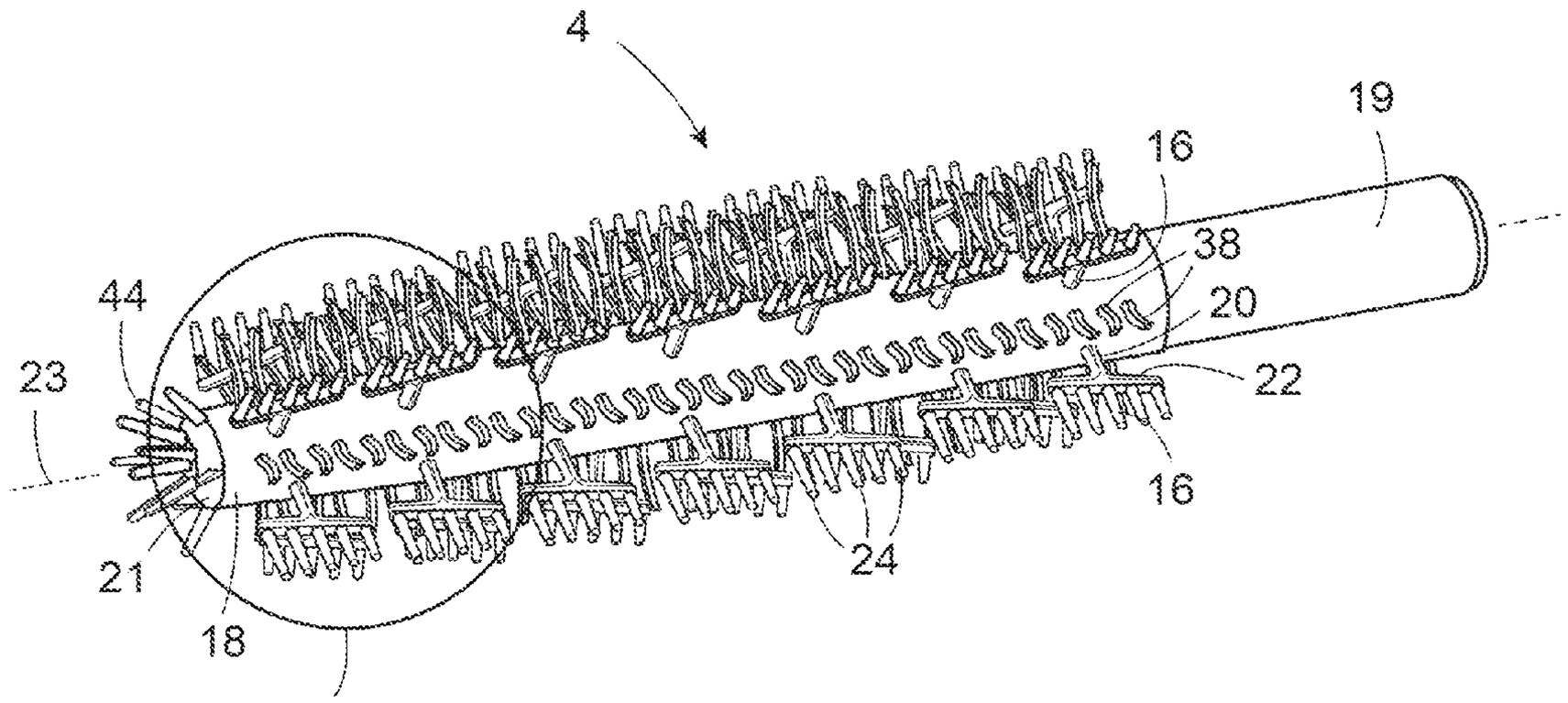
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FIG. 3

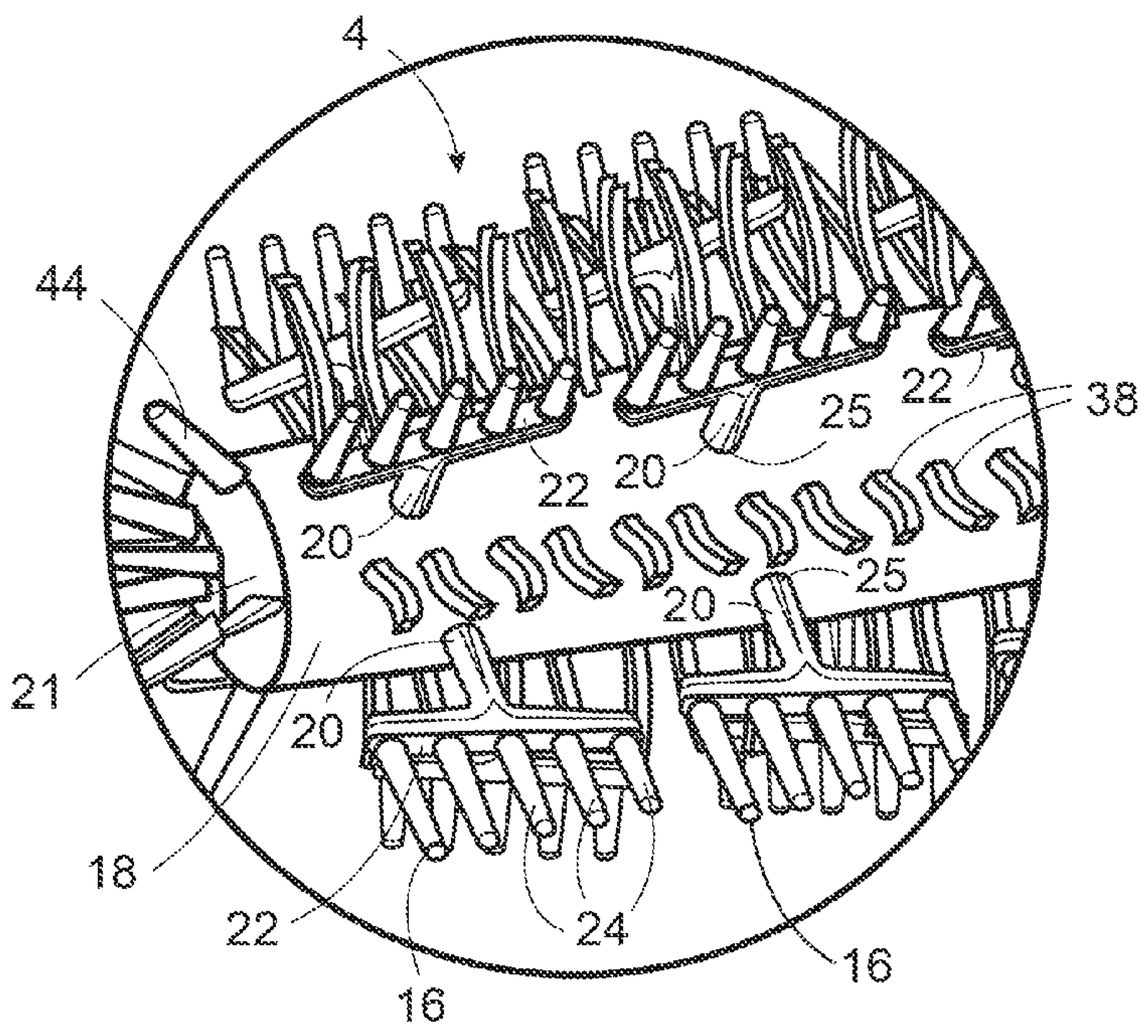
4
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FIG. 4

FIG. 5

FIG. 6

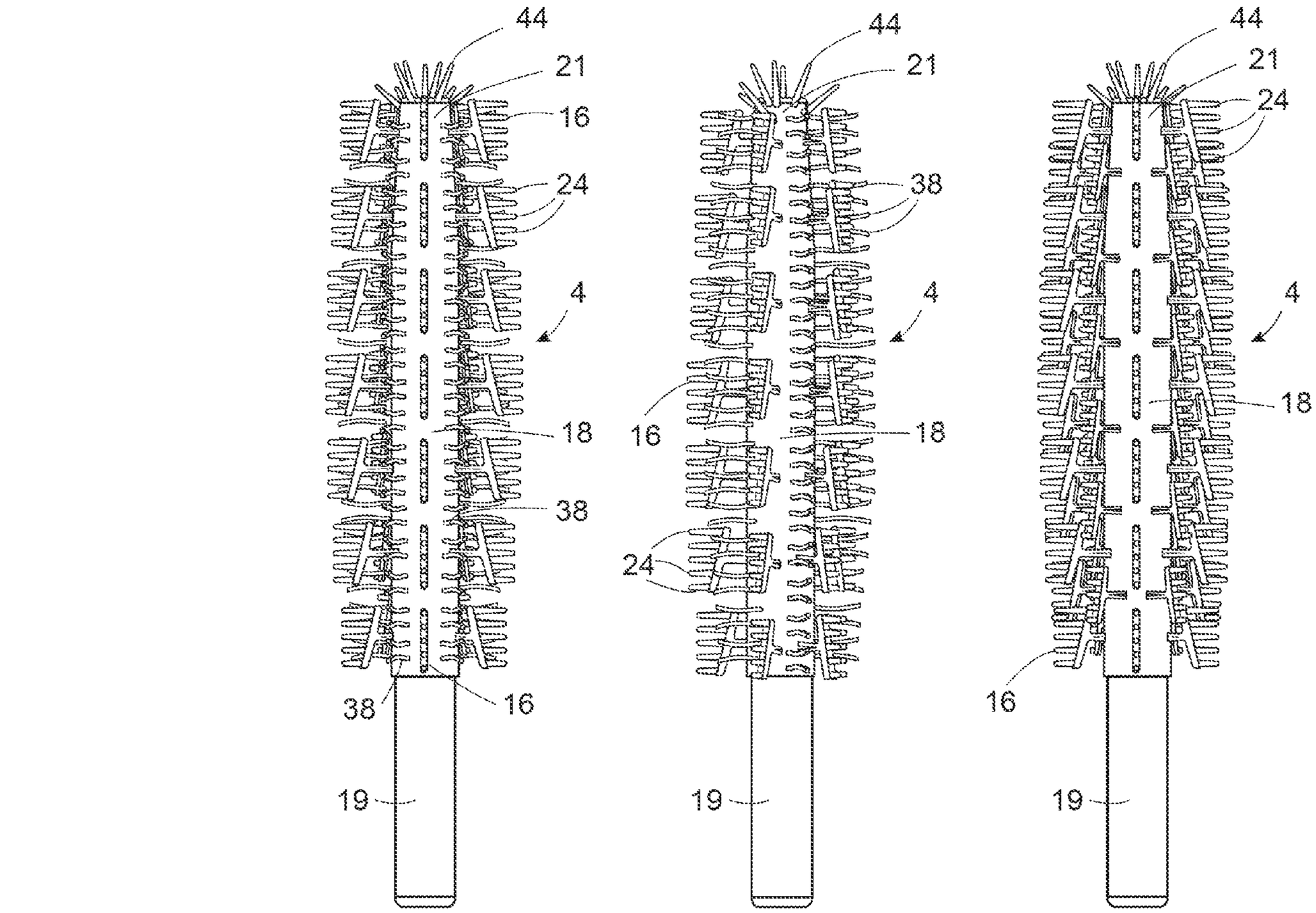


FIG. 7

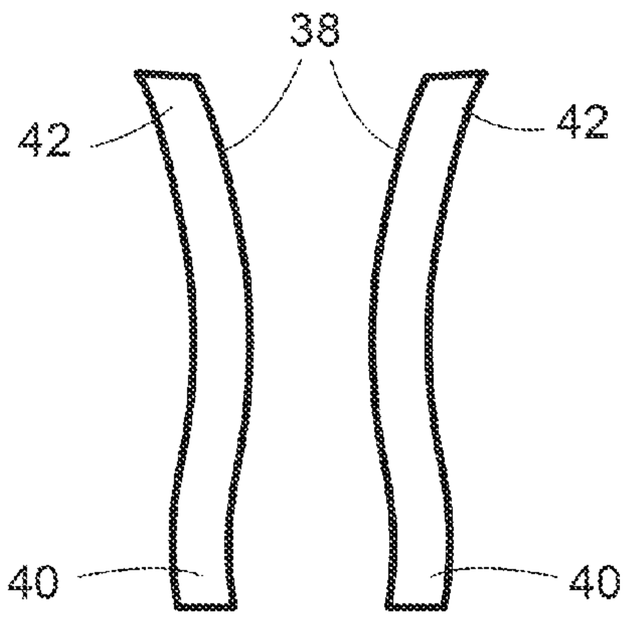


FIG. 8

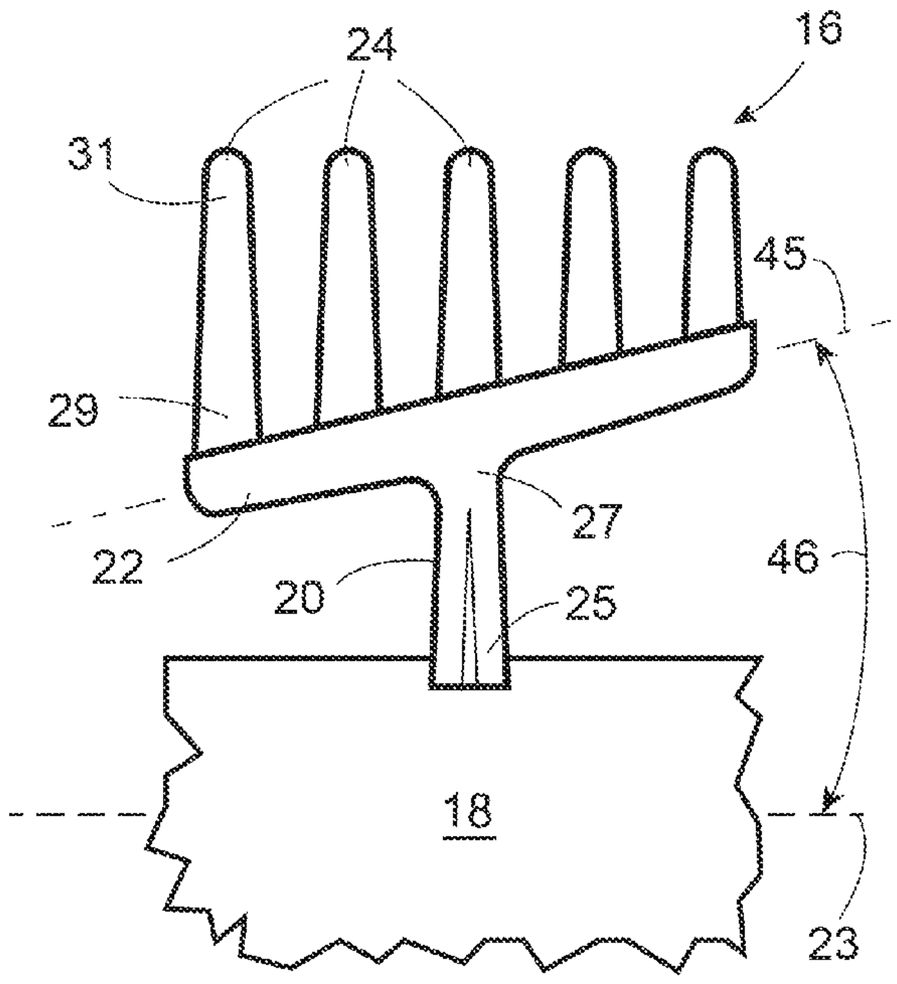


FIG. 9

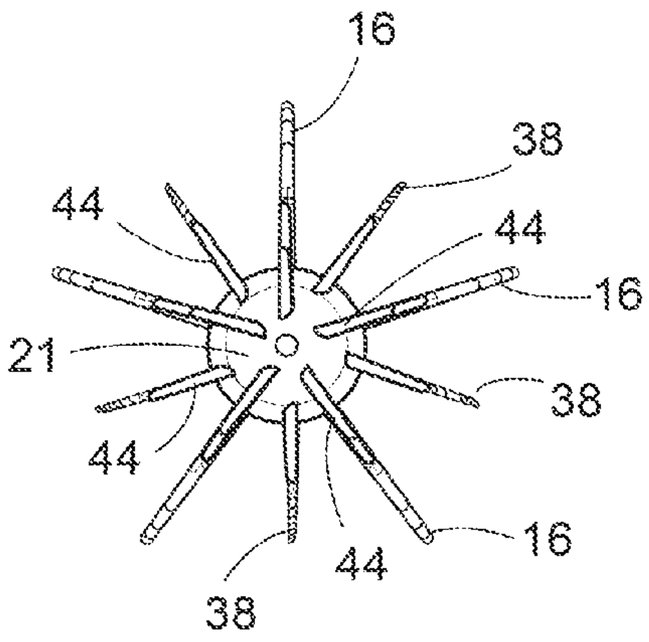


FIG. 10

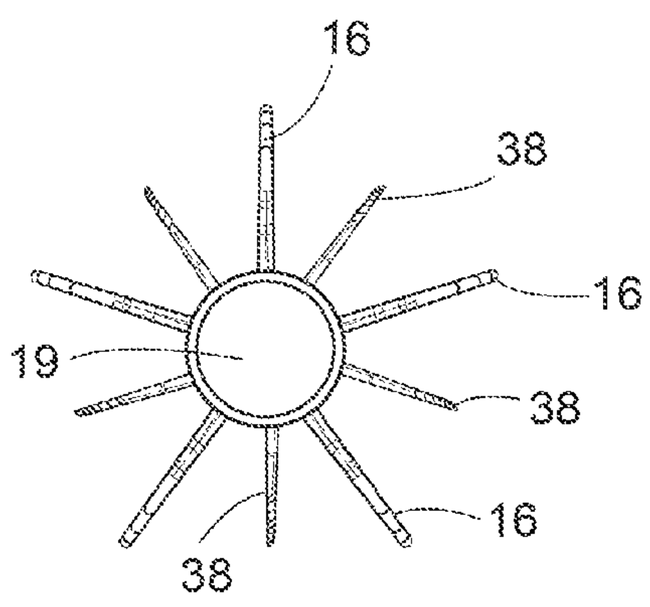


FIG. 11

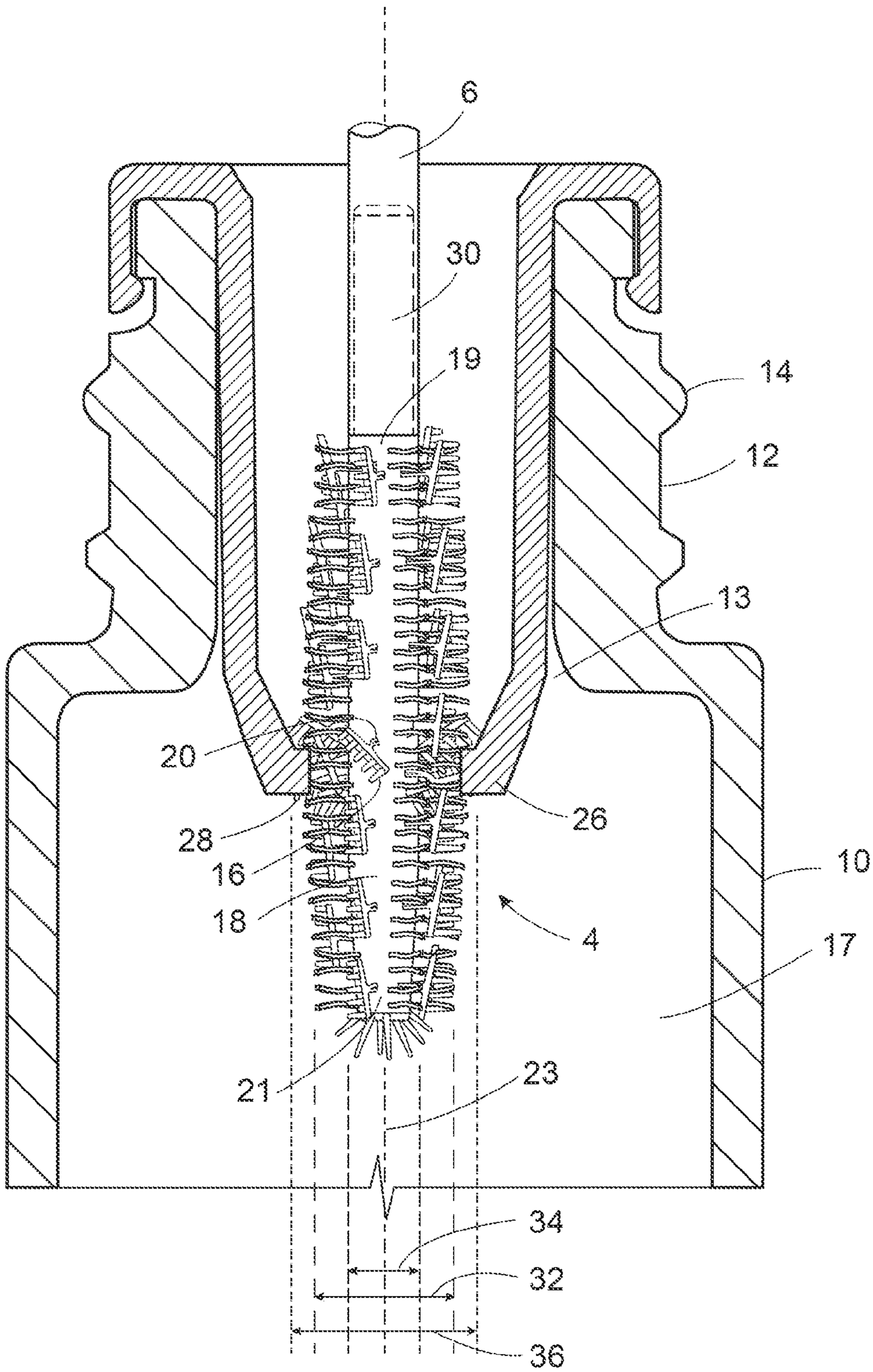


FIG. 12

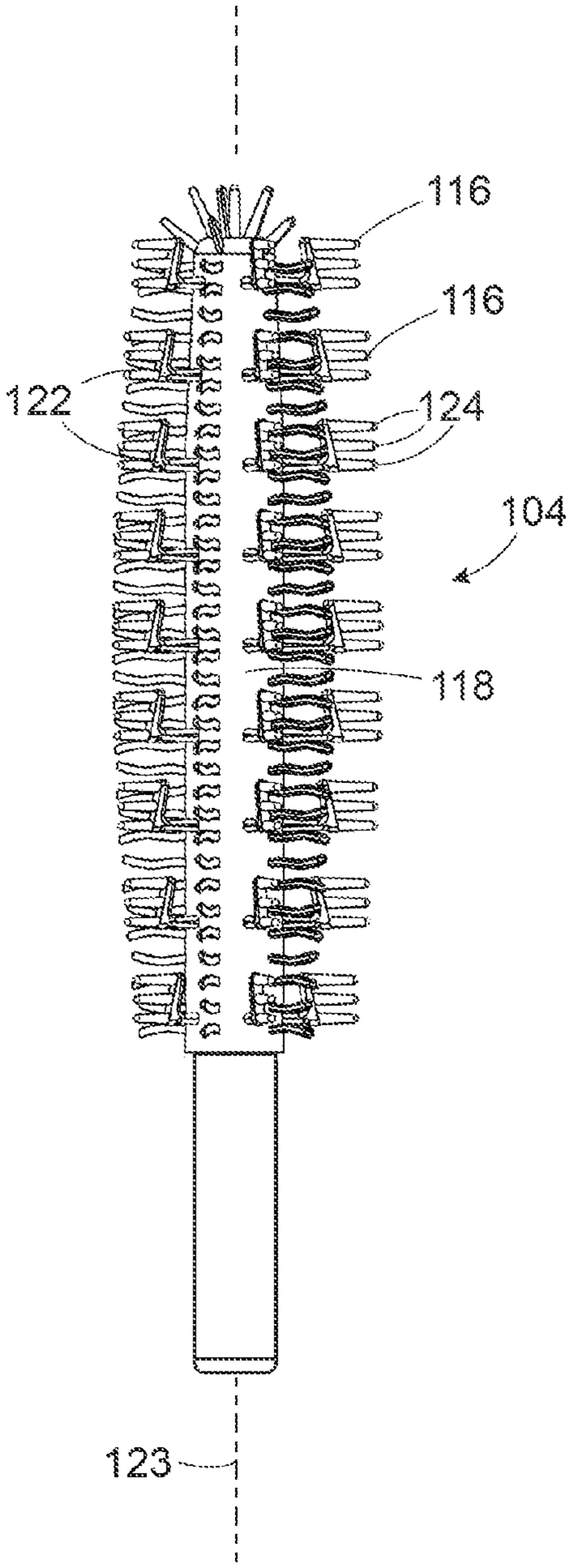


FIG. 13

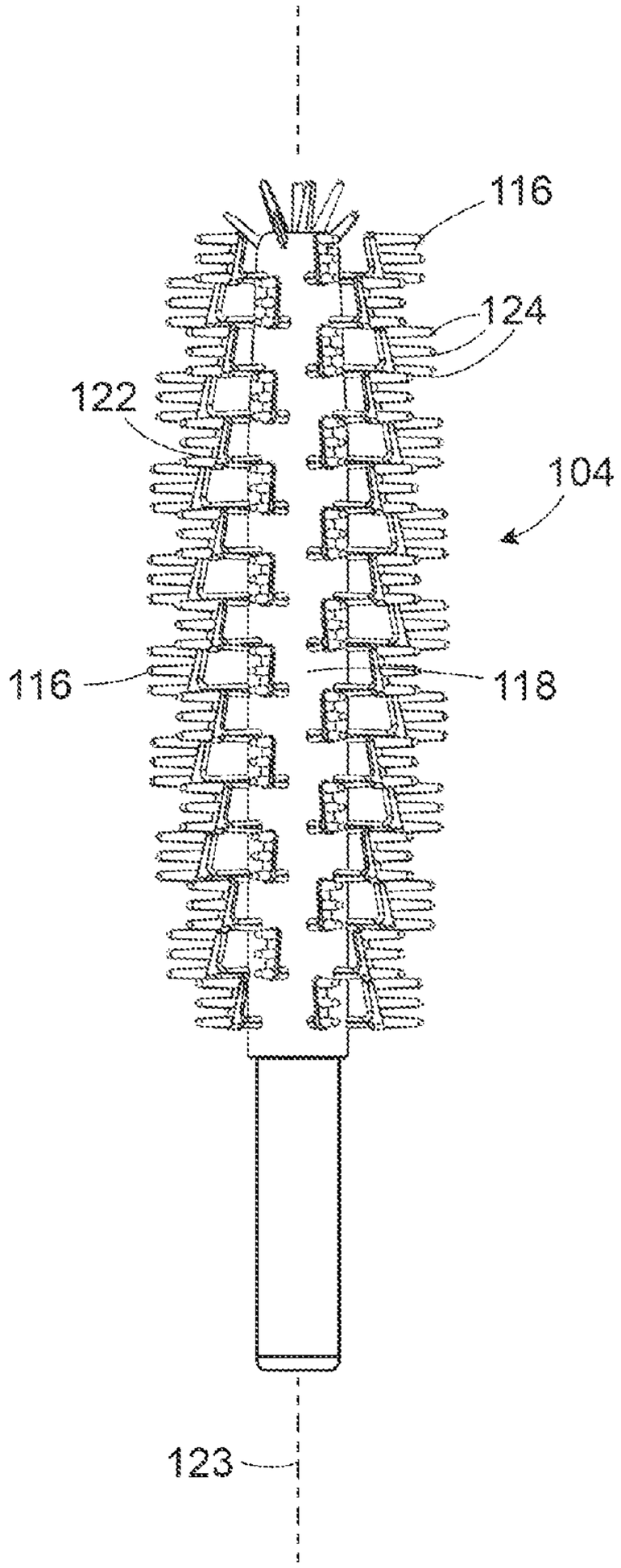
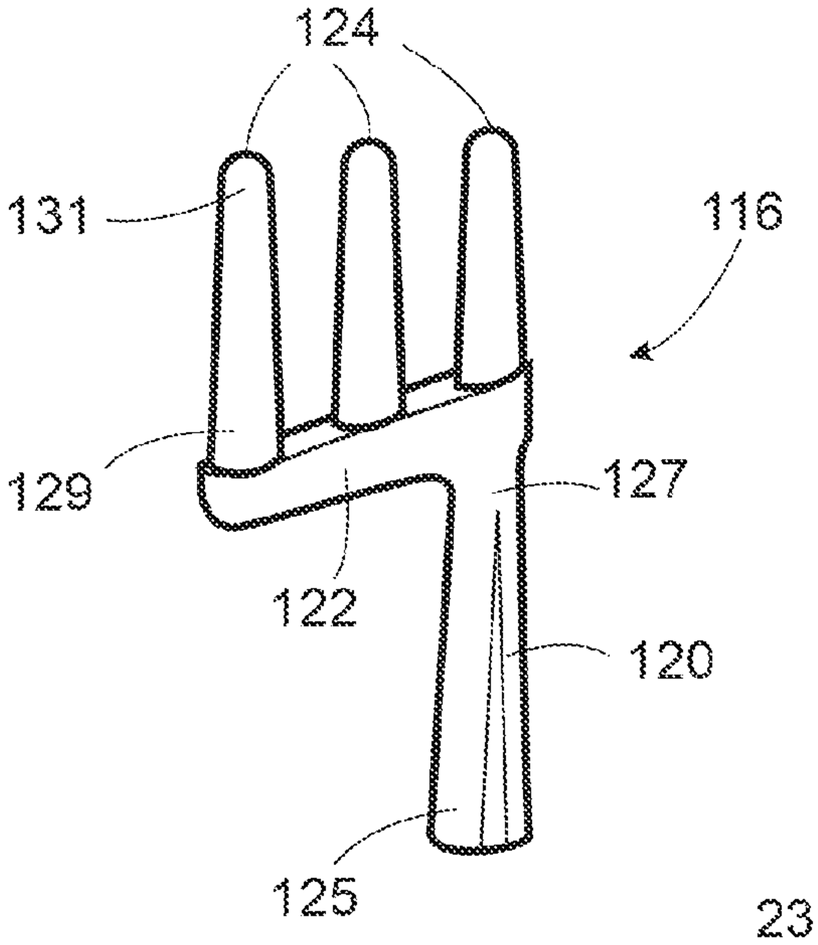


FIG. 14


124
131
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125

FIG. 15

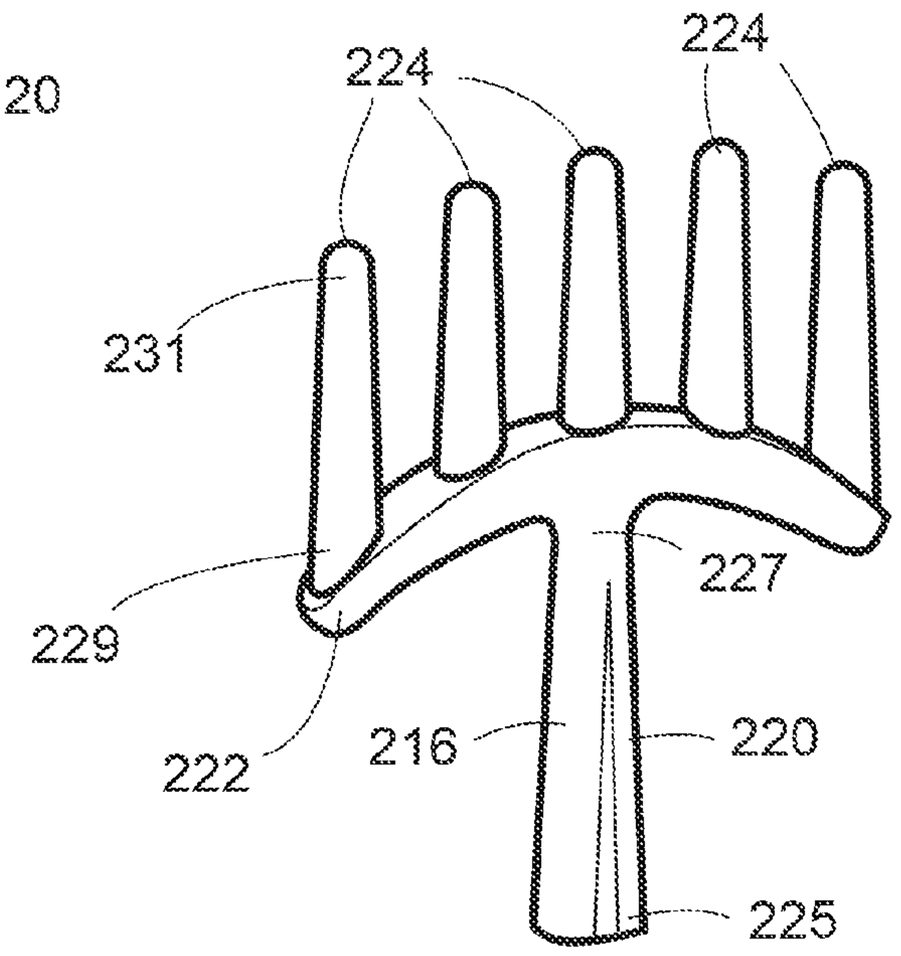
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FIG. 16

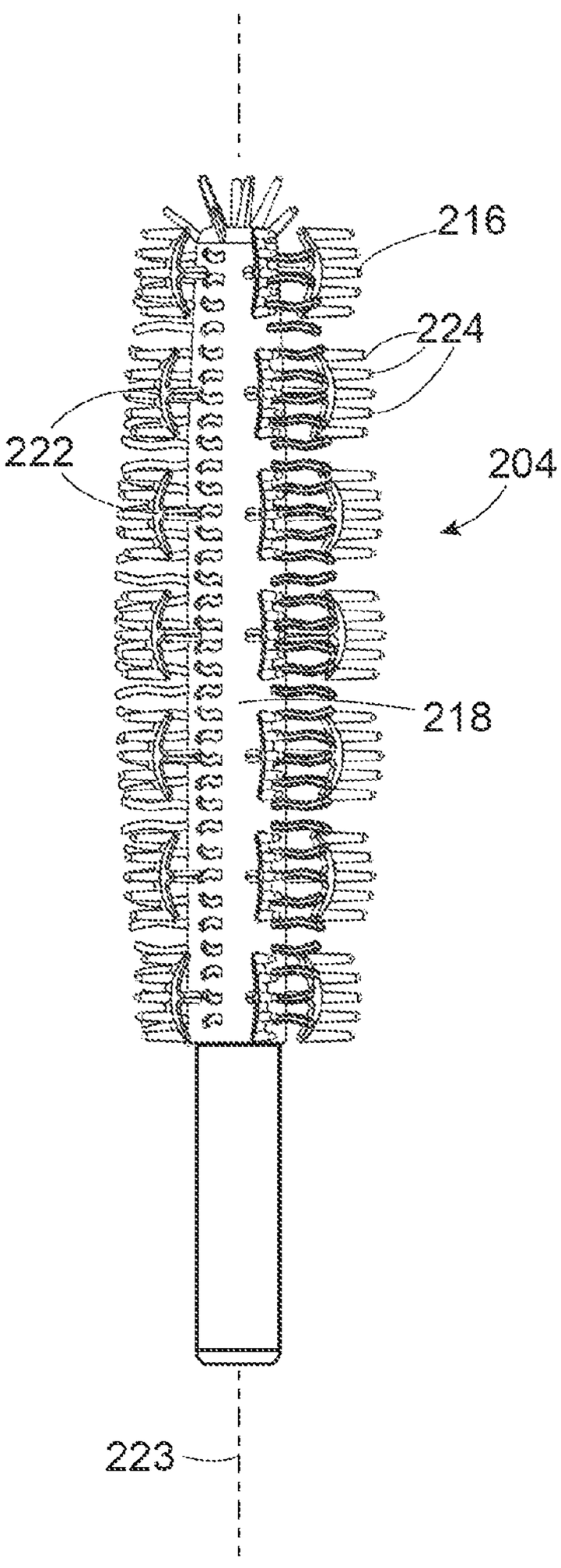
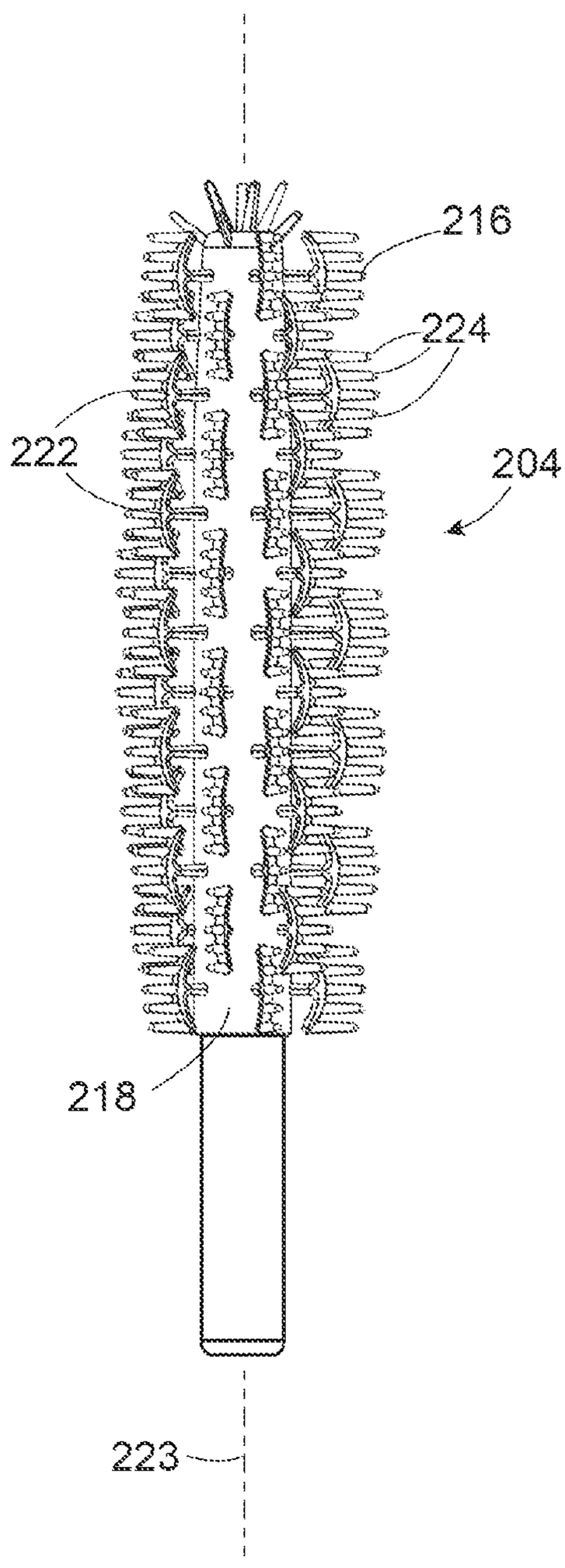


FIG. 17



MOLDED MASCARA BRUSH HEAD WITH RAKE-LIKE TEETH

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims priority from U.S. Provisional Application No. 62/186,720, filed Jun. 30, 2015.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention is a cosmetic applicator, more precisely a molded applicator brush. In particular, the present invention is directed to a cosmetic applicator brush for the application of mascara products to eyelashes or brow cosmetic products to eyebrows.

Description of the Prior Art

Molded cosmetic applicator brushes comprising several rows of fine plastic teeth, tines or bristles are well known. Many of these molded brushes include rows comprising a plurality of fine teeth, tines or bristles along the longitudinal axis of the brush core, the rows arranged radially, in a circular duplication of from 4 to 12 rows around the core. Generally, the profile or the design of these teeth, tines or bristles is the same along the length of the brush. Also, these teeth, tines or bristles each have a circular or semi-circular cross-section which is perpendicular to the core of the brush. Many of these standard molded brushes have generally straight teeth.

A problem with the prior art molded brushes is that a majority of the cosmetic product loaded on the brush tends to be accumulated at or close to the core of the brush after the brush is withdrawn from the product vial through a wiper. Yet, cosmetic application, particularly to hair and lashes is better accomplished if the majority of cosmetic product, e.g., mascara or eyebrow cosmetic, is loaded on the molded applicator at or near the surface of the brush defined by the free ends of the teeth, tines or bristles that make up the brush. However, with present applicator and vial designs, as the applicator is withdrawn from the vial, it passes through a wiper. The wiper removes excess cosmetic product near the free ends of the teeth, tines or bristles, i.e., near the surface of the brush defined by the free ends of the teeth, tines or bristles, and pushes the remaining product on the applicator away from the free ends toward the core of the applicator, i.e., at or near the base of the teeth, tines or bristles. Thus, as a conventional brush is withdrawn through a wiper, the majority of cosmetic product, e.g., mascara, is deposited and located near the core of the brush and not at the tips of the teeth, tines or bristles of the brush where it would be readily available for application. It is also known that lashes may not easily penetrate the surface of the brush to pass between the teeth, tines or bristles to access the cosmetic product loaded at or near the core of the brush.

Accordingly, there is a need for an applicator that retains and carries more cosmetic product at or near the relative surface of the applicator, i.e., at or near the free ends of the teeth, tines or bristles, after passing through the wiper.

BRIEF SUMMARY OF THE INVENTION

It is an object of the invention to provide a molded cosmetic applicator brush which carries more cosmetic product at or near the surface of the applicator, i.e., at or near the free ends of the teeth, tines or bristle after passing through the vial wiper.

It is a further object of this invention to provide a molded cosmetic applicator brush that loads combs, separates and increases the volume of cosmetic delivered on the eyelashes.

It is a further object of this invention to provide an increased make-up definition and an increased appearance of volume (a "volumizing effect") for each lash or brow. The "teeth" of this brush are new and have a unique design.

A cosmetic package is provided with an applicator brush head that has rake-like teeth extending from the core of the brush head. Each tooth has a flexible vertical post extending from the brush core to a horizontal beam. Several tines extend vertically from the beam to free ends. When the brush is drawn through a wiper in the product vial, the flexible vertical post allows the rake teeth to bend such that the tines pick up cosmetic product deposited at or near the core of the brush. As the brush head leaves the wiper, the rake-like teeth return to an upright position carrying the cosmetic product at or near the free ends of the tines.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an front elevation view of a cosmetic package of the present invention including an applicator illustrated in a position withdrawn from and above a cosmetic product vial;

FIG. **2** is a bottom, front and right side perspective view of a brush head portion of the cosmetic applicator shown in FIG. **1**;

FIG. **3** is an enlarged view of a portion of the brush head portion shown in FIG. **2**;

FIGS. **4-6** are right, back and left elevation views of the brush head portion shown in FIG. **2**.

FIG. **7** is a detail elevation view of a single shaft tooth of the present invention;

FIG. **8** is a detail elevation view of a 'rake' tooth of the present invention;

FIG. **9** is a bottom plan view of the brush head portion shown in FIG. **2**,

FIG. **10** is a top plan view of the brush head portion shown in FIG. **2**;

FIG. **11** is a partial sectional view of the brush head portion being drawn through a wiper in the product vial;

FIGS. **12-13** are front and left side elevation views of a second embodiment of the brush head portion of the invention, rear and right elevation views, respectively, being mirror images thereof;

FIG. **14** is a detail elevation view of the rake tooth of the second embodiment shown in FIGS. **12-13**;

FIG. **15** is a detail elevation view of a rake tooth of a third embodiment of the invention; and

FIGS. **16-17** are front and left side elevation views of the third embodiment of the brush head portion of the invention, rear and right elevation views, respectively, being mirror images thereof.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGS. **1-10**, a cosmetic package **1** (FIG. **1**) is shown with a cosmetic applicator **2** in a position withdrawn from and above a cosmetic product vial **10**. The applicator includes a brush head **4**, a stem rod **6** and a handle **8** that also serves as a cap for the vial **10**. The stem rod **6** is connected to and depends from the handle **8**. The stem rod **6** extends from the handle **8** to a support end **30**. The vial **10** has a neck **12** defining an opening **13** into a product reservoir **17** (see FIG. **11**) with a screw thread **14** externally thereon. A wiper **26** is secured in the neck opening **13** of the neck **12**.

The wiper **26** has a wiper orifice **28** defining a first cross-sectional dimension **32**. The handle **8** can also serve as a cap for the vial **10**. For this purpose, the handle/cap may be secured to the neck **12** of the vial **10** by suitable means for securing, such as, for example, the external screw thread **14** on the neck cooperating with an internal screw thread **15** in the handle **8**.

Referring now to FIGS. **2-3**, the brush head **4** has a core **18** with a proximal end **19** connected and secured to the support end **30** of the stem rod **6**. The core **18** extends to a distal end **21**. A longitudinal axis **23** is defined through the core from the proximal end **19** to the distal end **21**. The core **18** has a second cross-sectional dimension **34** that is less than the first cross-sectional dimension **32** of the wiper orifice **28** such that a deposit of cosmetic product remains at or near the core **18** when the brush head **4** is withdrawn from the product reservoir **17** through the wiper **26**.

A plurality of rake-like teeth **16** are secured to the core **18** and extend radially therefrom. As shown in FIGS. **2-3** and **8** (illustrating a single tooth of the plurality of teeth), each of the plurality of rake-like teeth **16** has a single post **20** with an inner end **25** connected to the core **18**, the post **20** extending radially outwardly from the core **18** in a direction perpendicular to the longitudinal axis **23** of the core **18** to an outer end **27**. A transverse beam **22** is connected to the outer end **27** of the post **20**. A long axis **45** of the beam **22** is generally perpendicular to the post **20**. At least two tines **24** are connected to the beam **22**. Each tine **24** has a first end **29** connected to the beam **22** and each tine **24** extends generally perpendicular to the longitudinal axis **23** of the core to a free end **31**. Accordingly, the vertical post **20** supports the generally horizontal transverse beam **22** which in turn supports the plurality of vertical tines **24**. In the first embodiment illustrated in FIGS. **1-10**, the transverse beam **22** is slightly angled from a perpendicular position with respect to post **20**, or, correspondingly, slightly angled from a parallel position with the longitudinal axis **23** of the core **18** of brush head **4**. The preferred angle **46** of the beam **22** relative to the longitudinal axis **23** of the core **18** is from 1° to 30°, more preferred from 5° to 20° and most preferred from 10° to 15°. As illustrated in the figures, the angle is 13.81°. However, the beam **22** may also be exactly perpendicular to the post **20**, i.e., exactly parallel with the longitudinal axis **23** of the core **18** of brush head **4**. The beam **22** may be straight or may be curved in any plane (see, for example, FIG. **15**, reference number **222**). In the first embodiment illustrated, five tines **24** are supported on the beam **22**. However, the plurality of tines **24** may include as few as two (2) tines **24** or more than five (5) tines **24**, or any number in between. Preferably, but not necessarily, the beam **22** may have an average length ranging from about 1 mm to about 8 mm; more preferably from about 4 mm to about 5 mm and most preferably from about 2 mm to about 3 mm.

Preferably, but not necessarily, each post **20** has an average height ranging from about 0.5 mm to about 8 mm. More preferably, each post **20** has an average height ranging from about 3 mm to about 5 mm and most preferably, each post **20** has an average height ranging from about 1.5 mm to about 3 mm.

Preferably, but not necessarily, the tines **24** have an average height ranging from about 0.5 mm to about 6 mm, more preferably from about 2 mm to about 3 mm and most preferably from about 1 mm to about 1.5 mm.

The average cross-sectional diameter of the teeth preferably ranges from about 0.1 mm to about 2 mm, more preferably from about 0.2 mm to about 1.5 mm, and most preferably from about 0.3 mm to about 0.9 mm.

The tines **24** may be straight or curved. The tines **24** may be perpendicular with respect to the beam **22**, i.e., parallel to a long axis of the post **20**. Alternatively, the tines **24** may be angled in any direction with respect to the beam **22** or post **20**.

The plurality of rake-like teeth **16** define a third cross-sectional dimension **36** for the brush head that is larger than the first cross-sectional dimension **32** of the wiper orifice **28**. The post **20** of each of the plurality of the teeth **16** is flexible to permit the teeth **16** to bend as the brush head **4** is withdrawn from the product reservoir **17** through the wiper orifice **28** such that the tines **24** load cosmetic product from that deposited at or near the core **18** and retains the loaded cosmetic product as the teeth **16** return to an upright position.

This is illustrated in FIG. **11**, a cross-sectional view of the brush head **4** partially withdrawn through the wiper **26**. To accommodate the passage of the larger diameter brush head **4** through the smaller diameter of the wiper orifice **28**, the posts **20** of the teeth **16** are provided with a degree of flexibility to allow the teeth **16** to bend as the brush head **4** passes through the wiper (see FIG. **11**). The teeth **16** bend towards the core **18** as the brush head **4** passes through wiper **26**, and return to an upright position after exiting the wiper **26**. The smaller diameter of the orifice **28** of the wiper **26** removes excess product from the brush head **4** as the applicator **2** is drawn out of the vial **10**, but the orifice **28** is dimensioned to leave a deposit of cosmetic product at or near the core **18** of the brush head **4**. As noted above, the orifice **28** of the wiper **26** pushes the teeth **16** toward the core **18** as the brush head moves through the wiper **26**. When the teeth **16** are pushed toward the core **18**, the tines **24** on the beam **22** dip into the cosmetic product deposited at or near the core **18**. The tines **24** pick up a supply of cosmetic product from the deposit at or near the core **18**. As the teeth **16** return to the upright position by way of plastic memory, the tines **24** carry this supply of cosmetic product from the core **18** such that cosmetic product in good amount is available near the surface of the brush, i.e., near the free ends **31** of the tines **24**. In this way, cosmetic product supply is best located for improved application to lashes or other surfaces.

The applicator **2**, including the core **18** and teeth **16**, may be molded as a unitary body from a suitable plastic material, or the handle **8**, stem rod **6** and brush head **4** may be molded separately of different materials and assembled by conventional means, such as, for example, gluing, bonding, press-fit or friction fit, welding, sonic welding, over-molding, etc. Preferably, the brush head **4** with rake-like teeth **16** comprising a core **18**, post **20**, beam **22** and tines **24** is molded as a unitary body from a single material such as, for example, any suitable plastic material. Preferred materials are, for example, polymers including silicone elastomers, thermoplastic elastomers (e.g., styrene-ethylene-butylene-styrene block copolymer—SEBS), vinyl elastomers (EVA), thermoplastic polyester elastomers (e.g., Hytrel® from DuPont de Nemours), thermoplastic polyurethane elastomers (pelethane® from Dow Plastic), Nitrile or EPDM. Hardness of the material is preferably from about 35 MPa (35 Shore D Hytrel® from DuPont de Nemours) to about 1180 MPa (82 Shore D Hytrel® from DuPont de Nemours). More preferably, tensile modulus ranges from about 95 MPa (45 Shore D Hytrel® from DuPont de Nemours) to about 570 MPa (72 Shore D Hytrel® from DuPont de Nemours). Most preferably, tensile modulus ranges from about 200 MPa (55 Shore D Hytrel® from DuPont de Nemours) to about 280 MPa (63 Shore D Hytrel® from DuPont de

Nemours), i.e., materials compounded to provide a degree of flexibility to the post **20** of the teeth **16**. Alternatively, the applicator **2** is molded from the plastic material by any suitable molding means, such as, for example, casting or injection molding. The resulting cosmetic applicator brush has excellent loading, combing, separating and volumizing properties when used on the eyelashes or eyebrows. It provides a high degree of make-up definition and an increased volumizing effect by delivering larger quantities of makeup product, such as mascara, to lashes or brows.

The brush head **4** may also include a plurality of single shaft teeth **38** each having a root end **40** secured to the core **18**, and each extending out from the core to a free tip **42**. Each of the plurality of single shaft teeth **38** extends radially from the core **18** between the proximal and distal ends, **19**, **21**, respectively, of the core **18** at locations between adjacent ones of the plurality of rake-like teeth **16**. The single shaft teeth **38** may be straight to wavy as shown. Each of the plurality of rake-like teeth **16** may be arranged in a first row along the length of the core **18**, and each of the plurality of single shaft teeth **38** may be arranged in a second row along the length of the core. A plurality of first rows of rake-like teeth and a plurality of second rows of single shaft teeth may be provided on the brush head, and each row of the plurality of first rows of rake-like teeth alternates with a row of the plurality of second rows of single shaft teeth (see FIGS. **9-10**). The rows of single shaft teeth **38** provide improved combing and doctoring capability to the brush head **4**.

Additional single shaft teeth **44** may be secured to the distal end **21** of the core **18** and extend outwardly from the distal end **21**. The additional single shaft teeth **44** extend from the distal end of the core at an angle of from about 0 degrees to about 90 degrees relative to the longitudinal axis **23** of the core **18**.

Referring now to FIGS. **12-14**, a second embodiment is illustrated with a brush head **104** having rake-like teeth **116**. The second embodiment includes rake-like teeth **116** with a single post **120** with an inner end **125** for connected to the core **118**. The post **120** extends radially outwardly from the core **118** in a direction perpendicular to the longitudinal axis **123** of the core **118** to an outer end **127**. A transverse beam **122** is connected to the outer end **127** of the post **120**. A long axis of the beam **122** is generally perpendicular to the post **120**. Three tines **124** are connected to the beam **122**. Each tine **124** has a first end **129** connected to the beam **122** and each tine **124** extends generally perpendicular to the longitudinal axis **123** of the core to a free end **131**.

Referring now to FIGS. **15-17**, a third embodiment is illustrated with a brush head **204** having rake-like teeth **216**. The third embodiment includes rake-like teeth **216** with a single post **220** with an inner end **225** for connected to the core **218**. The post **220** extends radially outwardly from the core **218** in a direction perpendicular to the longitudinal axis **223** of the core **118** to an outer end **127**. A transverse beam **222** is connected to the outer end **227** of the post **220**. A long axis of the beam **222** is generally perpendicular to the post **220**, but the beam **222** is convexly curved relative to the axis **223**. The beam **222** could similarly be concavely curved (not shown) relative to the axis **223**. Five tines **224** are connected to the beam **222**, but the curved beam **222** could support any suitable number of tines. Each tine **224** has a first end **229** connected to the beam **222** and each tine **224** extends generally perpendicular to the longitudinal axis **223** of the core to a free end **231**.

The objective of this invention is to load cosmetic product on the tines **24**, **124**, **224**, and in particular near the free ends **31**, **131**, **231**, of the tines. This is accomplished by providing the flexibility to the post **20**, **120**, **220** of the rake-like teeth **16**, **116**, **216**. The beam **22**, **122**, **222**, may be straight or curved in any plane, and may be symmetric or asymmetric relative to the position on the outer end **27**, **127**, **227**, of the post **20**, **120**, **220**.

Adjacent tines **24** on the beam **22** may be the same height from the first end to the free end or may vary in height along the length of the beam. For example, in the first and second embodiment, adjacent tines **24**, **124**, respectively, vary in height along the length of the respective beam **22**, **122**. In the third embodiment, the five adjacent tines **224** each have the same height along the length of the beam **222**, but as the beam is convexly curved relative to the axis **223**, the free ends **231** of adjacent tines **224** are at different relative heights with respect to the core of the brush.

As noted above, as a conventional brush is withdrawn through a wiper, the greatest quantity of cosmetic product, e.g., mascara, is deposited and located near the core of the brush and not at the tips of the bristles of the brush. It is known that lashes may not easily penetrate the outer surface of a brush applicator between the bristles to access the cosmetic product loaded at or near the core of the brush.

The present invention overcomes this shortcoming in the prior art by providing a brush head with rake-like teeth that bend and scoop up cosmetic product from near the core as the brush is withdrawn from the vial through the wiper opening. During the wiping process, i.e., when the brush head **4** is withdrawn through the wiper **26**, the wiper orifice **28** displaces the flexible rake-like teeth **16** toward the center of the brush, towards the core **18** of the brush. In the displaced position, the tines **24** of the teeth **16** load or pickup product from the deposit near the core and carry it to the surface of the brush as the teeth return to an upright position by the plastic memory of the underlying material. The cosmetic loaded at or near the free ends **31** of the tines **24** is more readily available for delivery and release upon application to, for example, eyelashes.

Because the present invention loads a majority of cosmetic product at or near the free ends of the tines **24**, **124**, **224**, it provides a high degree of product delivery to lashes and hair, resulting in a volumizing effect upon delivery. The brush provides a high loading on the eyelashes and then a high volumizing make-up result. The rake-like teeth allows loading and delivery of cosmetic product such as, for example, mascara, that is substantially better than loading and delivery by conventional teeth, tines or bristles. Each rake-like tooth **16** acts as a tank or reservoir holding a supply of cosmetic product to be delivered upon application to lashes or hair. This applicator can be used for mascara, eyelash or eyebrow treatment, or for other eyelash or eyebrow products.

It is understood that various modifications and changes in the specific form and construction of the various parts can be made without departing from the scope of the following claims.

What is claimed is:

1. A cosmetic package comprising:

a vial having a neck defining an opening into a product reservoir, a wiper secured in the opening, the wiper having a wiper orifice defining a first cross-sectional dimension, and

an applicator having a handle, a stem rod connected to and depending from the handle, the stem rod extending from the handle to a support end, and a brush head having:

a core with a proximal end connected to the support end of the stem rod, the core extending from the proximal

end to a distal end, a longitudinal axis defined through the core from the proximal end to the distal end, the core having a second cross-sectional dimension that is less than the first cross-sectional dimension of the wiper orifice such that a deposit of cosmetic product remains at or near the core when the brush head is withdrawn from the product reservoir through the wiper, and

a plurality of rake-like teeth secured to the core, each of the teeth comprising:

a post having an inner end secured to the core, the post extending radially outwardly from the core in a direction perpendicular to the longitudinal axis of the core to an outer end;

a beam secured to the outer end of the post, the beam generally perpendicular to the post, or at an angle relative to the longitudinal axis of the core of from 1° to 30°; and

at least two tines, each tine having a first end secured to the beam and each tine extending generally perpendicular to the longitudinal axis of the core to a free end;

wherein the plurality of rake-like teeth define a third cross-sectional dimension for the brush head that is larger than the first cross-sectional dimension of the wiper orifice, and the post of each of the plurality of the teeth is flexible to permit the teeth to bend as the brush head is withdrawn from the product reservoir through the wiper orifice such that the at least two tines of each of the plurality of teeth pick up cosmetic product from the deposit at or near the core and retain the cosmetic product as the teeth return to an upright position.

2. The cosmetic package of claim **1** wherein the handle is a cap for the vial.

3. The cosmetic package of claim **2** further comprising an internal thread in the cap and a cooperating external thread on the neck for securing the cap to the vial.

4. The cosmetic package of claim **1** further comprising a plurality of single shaft teeth, each having a root end secured to the core and each extending out from the core to a free tip.

5. The cosmetic package of claim **4** wherein the plurality of single shaft teeth extend from the distal end of the core at an angle of from about 0 degrees to 90 degrees relative to the longitudinal axis of the core.

6. The cosmetic package of claim **4** wherein each of the plurality of single shaft teeth extends radially from the core between the proximal and distal ends of the core at locations between adjacent ones of the plurality of rake teeth.

7. The cosmetic package of claim **6** wherein each of the plurality of rake-like teeth are arranged in a first row along the length of the core, and the plurality of single shaft teeth are arranged in a second row along the length of the core.

8. The cosmetic package of claim **7** further comprising a plurality of first rows of rake-like teeth and a plurality of second rows of single shaft teeth, and each of the plurality of first rows of rake-like teeth alternates with each of the plurality of second rows of single shaft teeth.

9. The cosmetic package of claim **1** wherein the at least two tines comprises two to six tines.

10. The cosmetic package of claim **1** wherein the at least two tines comprises three tines.

11. The cosmetic package of claim **1** wherein the at least two tines comprises four tines.

12. The cosmetic package of claim **1** wherein the at least two tines comprises five tines.

13. The cosmetic package of claim **1** wherein the beam is curved.

14. The cosmetic package of claim **1** wherein the at least two tines comprises three or more tines.

15. The cosmetic package of claim **1** wherein the beam is secured to the outer end of the post at an angle relative to the longitudinal axis of the core of from 5° to 20°.

16. The cosmetic package of claim **1** wherein the beam is secured to the outer end of the post at an angle relative to the longitudinal axis of the core of from 10° to 15°.

17. The cosmetic package of claim **1** wherein the beam is secured to the outer end of the post at an angle relative to the longitudinal axis of the core of 13.81°.

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